Stony Brook University

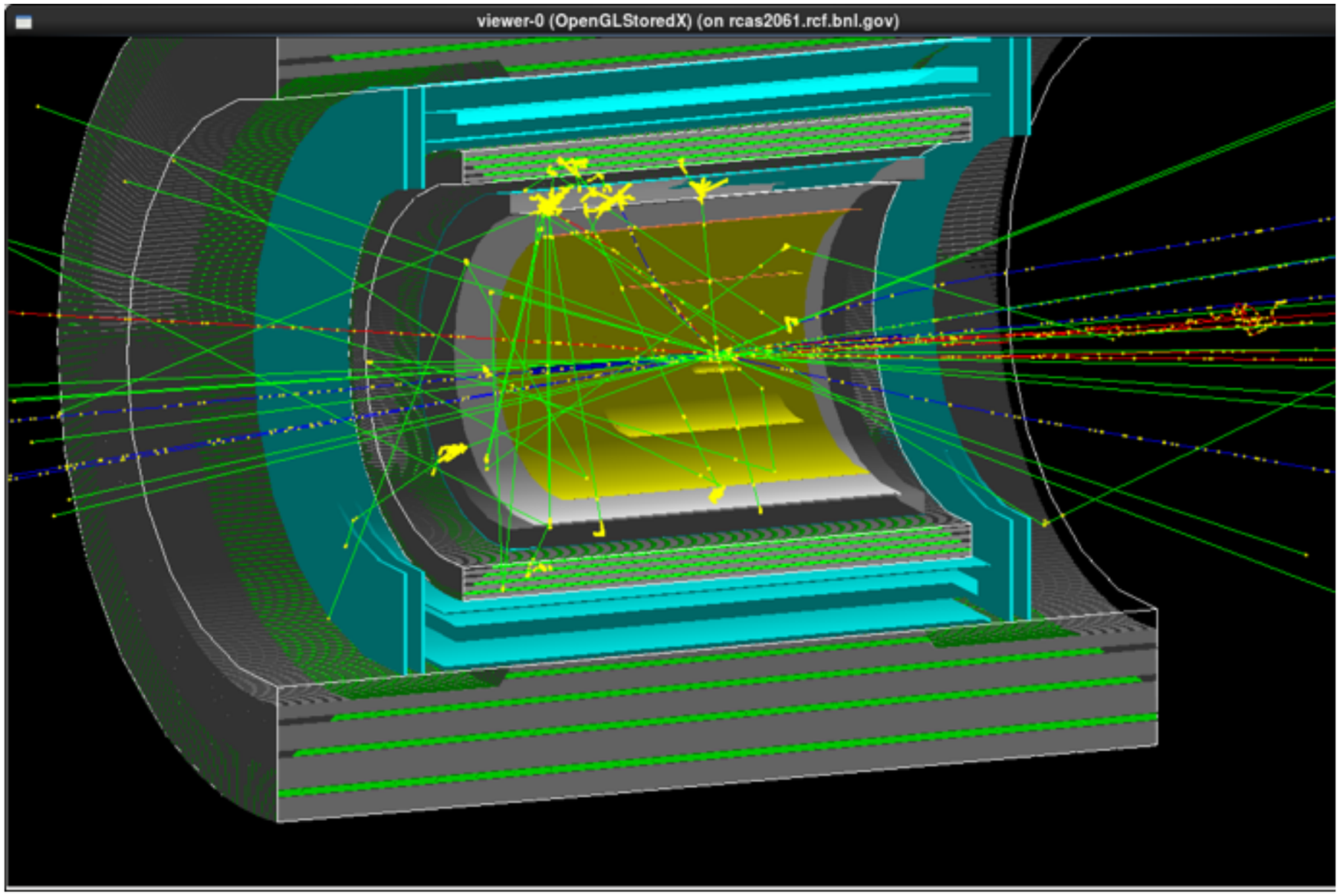
Using Pythia6 Within sPHENIX Simulation Framework

Nils Feege, Thomas Krahulik

Joint EIC detector / fsPHENIX Simulation Meeting

March 22 2016

Pythia6 to Geant4: Example Event



pp collision at $\sqrt{s}$ = 200 GeV

nfeege / coresoftware

forked from sPHENIX-Collaboration/coresoftware

Code | Pull requests 0 | Wiki | Pulse | Graphs | Settings

Branch: Pythia6 ▾ coresoftware / generators / PHPythia6 /

This branch is 4 commits ahead, 22 commits behind sPHENIX-Collaboration:master.


nfeege comment-out hard coded setting of process id

..	
Makefile.am	Add Pythia6 generator with HepMC node tree output
PHPythia.C	comment-out hard coded setting of process id
PHPythia.h	Add Pythia6 generator with HepMC node tree output
PHPythiaLinkDef.h	
autogen.sh	
configure.in	
phpythia6.cfg	Add Pythia6 generator with HepMC node tree output

Pull request under review: https://github.com/sPHENIX-Collaboration/coresoftware/pull/115

Storing Pyhtia6 events as HepMC

PHPythia.C:

sPHENIX framework uses HepMC to interface event generators with Geant4 simulation

```
18  #include <HepMC/PythiaWrapper.h>
19  #include <HepMC/IO_HEPEVT.h>
20  #include <HepMC/IO_GenEvent.h>
```

[…]

```
281 int PHPythia::process_event(PHCompositeNode *topNode) {
282
283   if (verbosity > 1) cout << "PHPythia::process_event - event: " << _eventcount << endl;
284
285 /* based on HepMC/example_MyPythia.cc
286  *.....................................HepMC INITIALIZATIONS
287  *
288  * Instantiate an IO strategy for reading from HEPEVT. */
289 HepMC::IO_HEPEVT hepevtio;
290
291 call_pyevnt();      // generate one event with Pythia
292 // pythia pyhepc routine converts common PYJETS in common HEPEVT
293 call_pyhepc( 1 );
294 HepMC::GenEvent* evt = hepevtio.read_next_event();
295
```

nfeege / **macros**
forked from sPHENIX-Collaboration/macros

<> Code | Pull requests 0 | Wiki | Pulse | Graphs | Settings

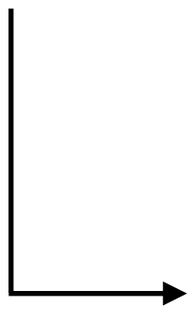
Branch: **Pythia6** ▾ **macros** / macros / **g4simulations** /

This branch is 1 commit ahead, 3 commits behind sPHENIX-Collaboration:master.


nfeege Add option to use Pythia6 event generator

..

DisplayOn.C	Add 2 more command (create eps file and set background) to display
Fun4All_G4_fsPHENIX.C	switch to fsPHENIX map from Cesar
Fun4All_G4_sPHENIX.C	Add option to use Pythia6 event generator



```
21  // Use particle generator
22  const bool runpythia8 = false;
23  const bool runpythia6 = false;
24
```

To do's

- Check event generator output:
  - Configuration file parsed properly?
  - Correct indices in C++ / Fortran interface arrays?
  - Correct conversion to HepMC events?
    - All necessary information stored in HepMC events?

- Make event generator work with ep / DIS configuration files needed for EIC (some configuration settings are not implemented yet and PDF libraries used for EIC are missing)